

*Critical Review
of
“The Renault
LCA Methodology Report
2015”*

according to
ISO 14040 & ISO 14044
and ISO/TS 14071

SOL 15-017.1

December 2015

for

Renault

1 General introduction – context of the Critical Review

Renault has requested Solinnen to perform the critical review (CR) of the Life Cycle Assessment (LCA) methodology used to support all car LCA reports produced by Renault. This methodology consists in a “**generic LCA model**” developed internally based on the Gabi 6.0 LCA software and a “**methodology report**” describing in detail the methodology, the model and the databases.

This generic LCA methodology aims at enabling Renault to perform any comparative LCA of two Renault vehicles, with same (or improved) functionalities, dedicated to the same market and same commercial target.

The LCA work has been done by a team, including Renault collaborators and subcontractors of Renault.

This LCA critical review work is the review of the model and the methodology report in their 2015 version. The methodology report is dedicated to be publicly communicated with each specific LCA study. Renault aims at continuously improving its LCA methodology and the report will be updated on a regular basis (a new version is overseen for 2016).

The reviewers are Dipl. Eng. Philippe Osset (Solinnen), assisted by Dipl. Eng. Delphine Bauchot (Solinnen).

Note: the process for the LCA model and methodology work was the following:

- Development of tools with Thinkstep (formerly “PE International”):
 - BOM import to easily and electronically import specific data into the generic model,
 - Specific Plans to automatically connect process datasets with raw material datasets for the manufacturing of common car parts,
 - A generic model based on Gabi software, Gabi database as well as the above mentioned tools to perform any comparative LCA of two Renault vehicles,
- Drawing up of the Renault LCA methodology report, describing the methodology, the model and the databases that are to follow and use to conduct any LCA within the group,

2 Introduction to the present CR report

The present report, prepared by Solinnen, is the “Final CR report” of the model and the LCA methodology report. This CR report, excluding appendices, is dedicated to be integrated as a whole within the final LCA methodology report.

3 Nature of the CR work, CR process and limitations

Solinnen has worked according to the requirements of ISO 14040:2006 and 14044:2006 concerning CR, and according to ISO/TS 14071.

The process for the LCA methodology report CR was the following:

- The model developed with Gabi 6.0 software was presented to the reviewers.
- The LCA methodology report has been reviewed by Solinnen as “draft final LCA methodology report”. All comments on the report and on the model made by the reviewers were discussed with the practitioner (written and oral exchanges).
- A complementary review was made on a second version of the methodology report and some additional comments were emitted and discussed with the practitioner.
- The final CR report is made based on a third and final version of the methodological report and the responses of the practitioner to the comments of the CR.

The present CR report is the CR by Solinnen. The detailed comments, together with the answers of the practitioner, are provided as appendices.

The present CR report is delivered to Renault. Solinnen cannot be held responsible of the use of its work by any third party. The conclusions of Solinnen cover the final LCA methodology report (version 2015) and no other report, extract or publication which may eventually been done. Solinnen conclusions have been set given the current state of the art and the information which has been received. These conclusions could have been different in a different context.

4 Conclusions of the review of the LCA methodology report

According to ISO 14044, the critical review process has worked in order to check if:

- the methods used to carry out the LCA are consistent with ISO 14044 requirements,
- the methods used to carry out the LCA are scientifically and technically valid,
- the database used is appropriate and reasonable in relation to the goal of the study,
- the limitations of the model and the methodology are identified and assessed, and
- the methodology report is transparent and consistent.

The practitioner has improved its LCA report during the CR process, integrating most of the comments.

Nevertheless, some issues remain uncovered by the modifications that Renault has done for each of these points or will be addressed in the future (version 2016 of the methodology report). The key ones are listed in the following chapter and are mainly bound to the following elements

- the relevance of the scenario used for the assessment and the comparison of all Renault vehicles,
- the relevance of the impact assessment methods,
- the description of the methodology (language and level of detail),
- the completeness and consistency of the methodology for the end of life.

As a whole, Solinnen considers the methodology report as being of high quality level as other existing LCA reports covering the same scope. The LCA requirements of ISO 14040 and ISO 14044 have been answered in the best possible manner.

Remark: Renault will use the reviewed database and the reviewed methodology report to elaborate their comparative LCA reports. A Critical Review has to be done on each specific comparative LCA report since the fact that the present methodology is of high quality does not ensure that it is correctly used to generate each “comparative LCA

report". As a whole, the present Critical Review concludes a first step of the overall ISO 14044 Critical Review process. The present CR can be referred to within each specific comparative LCA report.

5 Detailed comments

The following lines bring some highlights that a reader of the final LCA methodology report (version 2015) may use to assist his reading and understanding of the methodology report. They recap some critical comments which were not addressed or are planned to be addressed by Renault in the future.

5.1 Consistency of methods used with ISO 14044 requirements

The functional unit is defined in detail, but the choice to cover 150 000 km over 10 years is an average scenario and is not adapted to the specific use of each Renault vehicle. The scenario shall be selected in relation with the vehicles to be compared (the compared vehicles, being designed for the same market, are designed to provide – at least – the same functionality and therefore to be comparable) in order to avoid any bias in the final results and also avoid any misunderstanding or inaccurate comparison by the public.

Moreover in order to anticipate the regulatory requirements in 2017 and ensure the relevance of the comparative LCA studies performed by Renault over the following years, the scenario WLTC would need to be included in addition to the NDEC scenario.

As a whole, the structure of the methodology report reflects the expectations of ISO 14044 for LCA reports that are intended to be communicated to the public.

5.2 Scientific and technical validity

As regards the recycling of materials, the rules adopted to allocate the recycling process burden shall be consistent for all materials. A review of the allocation rules adopted for each material in the Gabi 6.0 database is needed to highlight any bias and amend if appropriate.

In term of the indicators choice, it has been recommended to Renault to review the relevance of the indicators considered, especially regarding the public targeted and the forthcoming regulations (such as the Product Environmental Footprint PEF initiative).

As a whole, the scientific and technical choices that have been made are adapted to the LCA studies done.

5.3 Appropriateness of database used in relation to the goal of the study

As regards data related to waste management, the recycling of spare parts as well as the end of life of the industrial waste at the manufacturing site are not taken into account. Whereas this has no significant impact on the comparison of Renault vehicles (two comparable vehicles are supposed to have the same kind of spare parts and industrial waste), such impact shall be considered to ensure a comprehensive view of the impacts of each vehicle and each phase of its life cycle.

As a whole, the data used are appropriated to the goal of the study.

5.4 The limitations of the methodology

The limits are well described in the methodological report. Additionally the methodological report shall require for each study to make clear link between environmental benefit and technological improvement on the new vehicle studied.

As a whole, the limitation are clearly stated and assessed.

5.5 Transparency and consistency

As regards the description of the model and the methodology, some additional and detailed information are welcomed to fully and precisely understand the approach. For example a detailed description of the average production process as well as the generic description of a “Gabi plan” (mapping file) would have eased the understanding of the methodology.

The methodology report is fully transparent regarding the methodology choices that are applied by Renault.

6 Appendices

The tables exchanged during the work are the appendices of the present CR report. They recap the detailed exchanges between the CR reviewers and Renault. Renault will keep track of them in order to improve in the future the next version of its LCA model and methodology report.